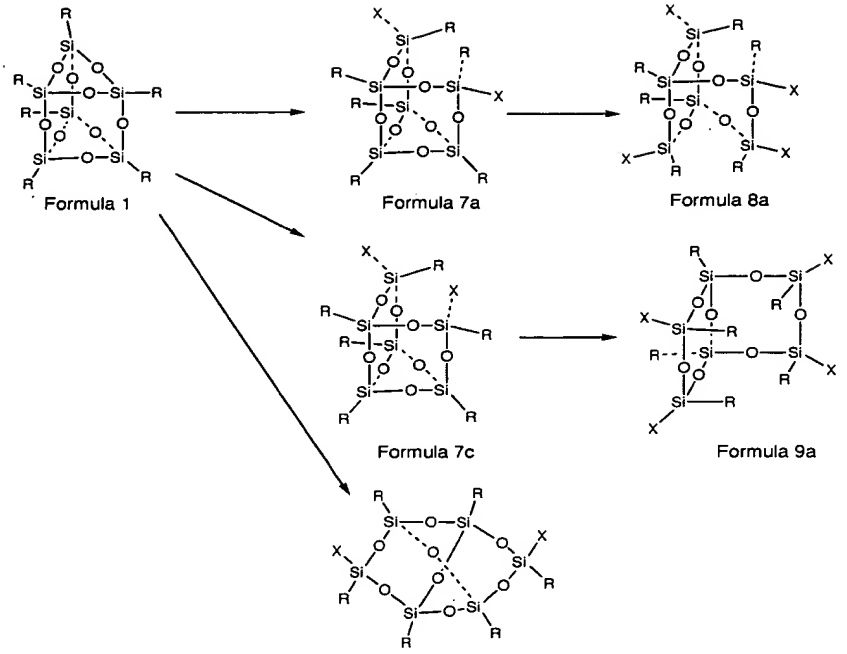
5. A method for selectively opening the rings in POSS compounds to form functionalized POSS derivatives comprising, reacting $[(RSiO_{1.5})_n]_{\Sigma\#}$, $[(RSiO_{1.5})_n(R^3SiO_{1.5})_m]_{\Sigma\#}$ or $[(RSiO_{1.5})_n(R^1R^2SiO_{1.0})_m]_{\Sigma\#}$ with a strong acid to form said derivatives, having a conjugate base which base is F, OH, SH, NHR, $NR_2$, $ClO_4$, $SO_3CH_3$, $SO_3CF_3$, $SO_3OH$, $SO_3Cl$, $SO_3CH_3$, $NO_3$, $PO_4$ or Cl, where n is 6-12, m is 1-10, where $R^1$, $R^2$ and $R^3$ are different substituents than R which are all selected from the group consisting of aliphatic, aromatic, olefinic, alkoxy , siloxy and H and where # is the sum of the lettered substituents in said POSS compound.

10. The method of claim 5 wherein $[(RSiO_{1.5})_n(R^3SiO_{1.5})_m]_{\Sigma\#}$ is reacted with said acid to form $[(RSiO_{1.5})_6(R^3XSiO_{1.0})_i(RXSiO_{1.0})_1]_{\Sigma 8}$, where $R^3$ is of the same group as R but is a different substituent and # is m + n.

11. The method of claim 5 wherein $[(RSiO_{1.5})_7(R^3SiO_{1.5})_1]_{\Sigma 8}$ is reacted with said acid to form $[(RSiO_{1.5})_4(RXSiO_{1.0})_3$ and $R^3$ is of the same group as R but is a different substituent.

12. The method of claim 3 wherein the compound of formula 1 is reacted with said acid to form a compound selected from the formulas 7a, 8a, 7c, 9a or 7d as follows:




18. A polyhedral oligomeric silsesquioxane (POSS) compound of the formula, $[(RSiO_{1.5})_n(RXSiO_{1.0})_m]_{\Sigma\#}$, where n is 4-24, m is 1-10, R is aliphatic, aromatic, olefinic, alkoxy, siloxy or H and X is the conjugate base of an acid, which base is of F, OH, when the OH groups are in an exo-stereochemical position, SH, NHR or $NR_2$, $C1O_4$, $SO_3OH$, $SO_3CF_3$, $SO_3Cl$, $SO_3CH_3$, $NO_3$, or $PO_4$, when said compound has at least three open rings.

19. The POSS compound of claim 18 selected from the group consisting of $[(RSiO_{1.5})_n(RXSiO_{1.0})_m]_{\Sigma\#}$, $[(RSiO_{1.5})_n]_{\Sigma\#}$, $[(RSiO_{1.5})_n(R^3SiO_{1.5})_m]_{\Sigma\#}$, and $[(RSiO_{1.5})_n(R^1R^2SiO_{1.0})_m]_{\Sigma\#}$.

20. A method for expanding rings in polyhedral oligomeric silsesquioxane (POSS) compounds comprising, reacting $[(RSiO_{1.5})_n(R(HO)SiO_{1.0})_m]_{\Sigma\#}$ with $Y_2SiR^1R^2$ silane reagents to obtain at least one expanded POSS ring in $[(RSiO_{1.5})_{n+m}(R^1R^2SiO_{1.0})_j]_{\Sigma\#}$, where R, $R^1$ and $R^2$ are